

Claims

1 1. A client system for dynamic visualization of image data provided through  
2 a network communications channel, said client system comprising:

3 a) a parcel request subsystem, including a parcel request queue,  
4 operative to request discrete image data parcels in a priority order and to store  
5 received image data parcels in a parcel data store, said parcel request subsystem  
6 being responsive to an image parcel request of assigned priority to place said  
7 image parcel request in said parcel request queue ordered in correspondence with  
8 said assigned priority; and

9 b) an parcel rendering subsystem coupled to said parcel data store  
10 to selectively retrieve and render received image data parcels to a display  
11 memory, said parcel rendering system providing said parcel request subsystem  
12 with said image parcel request of said assigned priority.

1 2. The client system of claim 1 wherein said parcel rendering subsystem  
2 determines said assigned priority based on a determined optimal image  
3 resolution level.

1 3. The client system of claim 2 wherein said display memory is coupled to an  
2 image display of predetermined resolution and wherein said determined optimal  
3 image resolution level is based on said predetermined resolution.

1 4. The client system of claim 3 wherein said assigned priority further reflects  
2 the proximity of the image parcel referenced by said image parcel request to a  
3 predetermined focal point.

1 5. The client system of claim 4 wherein said discrete image data parcels are  
2 of a first fixed size as received by said parcel request subsystem and of a second  
3 fixed size as rendered by said parcel rendering subsystem.

1 6. The client system of claim 5 wherein said discrete image data parcels each  
2 include a fixed-size array of pixel data.

1 7. A portable display client system supporting dynamic visualization of image  
2 data provided through a wireless network communications channel, said client  
3 system comprising:

4 a) a display of defined resolution suitable for visual presentation of a  
5 graphical image, said display including video memory for storing image data  
6 representative of said graphical image;

7 b) a network interface coupleable to a wireless network through which to  
8 request and receive image data parcels;

9 c) an image parcel data store providing for the storage of image data  
10 parcels;

11 d) navigation controls providing input information defining a point of view  
12 location relative to said graphical image; and

13 e) a processor coupled to said video memory, network interface, image  
14 parcel data store, and navigational controls, said processor operative to

15 selectively request image data parcels of determined resolution through said  
16 network interface in a priority order computed relative to the defined resolution  
17 of said display.

1 8. The portable display client system of claim 7 wherein said processor  
2 includes a priority queue of waiting requests for image data parcels and wherein  
3 said processor adds requests for image data parcels to said priority queue  
4 reflective of the computed priority of each of said waiting requests.

1 9. The portable display client system of claim 8 wherein said processor is  
2 operative to render said image data parcels from said image parcel data store to  
3 said video memory.

1 10. The portable display client system of claim 9 wherein said image data  
2 parcels are received as compressed data blocks within respective network data  
3 packets.

1 11. The portable display client system of claim 10 wherein said respective  
2 network data packets each include a fixed block size compressed image data  
3 parcel corresponding to a minimum 16 by 16 array of pixel image data parcel.

1 12. A client system providing for the three-dimensional viewing of an image  
2 relative to a dynamic viewpoint, said client system comprising:  
3 a) display memory corresponding to a two-dimensional display of defined  
4 resolution;

5           b) a network interface through which image data parcels of respective  
6 image parcel resolution can be requested and received;  
7           c) navigational controls providing for the definition of an image viewpoint;  
8 and  
9           d) a processor operative to progressively render image data parcels into  
10 said display memory and to progressively request image data parcels through  
11 said network interface in a priority order determined with respect to the defined  
12 resolution of said two dimensional display and the location of said image  
13 viewpoint.

1   13.   The client system of Claim 12 wherein said processor is operative to limit  
2 the progressive request of image data parcels to a resolution corresponding to  
3 said defined resolution.

1   14.   The client system of Claim 13 wherein the priority of a predetermined  
2 image parcel within said priority order is determined based on the three-  
3 dimensional projection area within said two-dimensional display relative to said  
4 image viewpoint of said predetermined image parcel.

1   15.   The client system of Claim 14 wherein the priority of said predetermined  
2 image parcel is further determined based on the location of said image parcel  
3 within said two-dimensional display relative to said image viewpoint.

1   16.   A method of supporting dynamic visualization of image data transferred  
2 through a communications channel, said method comprising the steps of:

3 a) determining, in response to user navigational commands, a viewpoint  
4 orientation with respect to an image displayed within a three-dimensional space;

5 b) requesting, in a priority order, image parcels renderable as  
6 corresponding regions of said image, each said image parcel having an  
7 associated resolution, wherein said priority order is determined to provide a  
8 progressive regional resolution enhancement of said image as each said image  
9 parcel is rendered;

10 c) receiving a plurality of image parcels through said communications  
11 channel; and

12 d) rendering said plurality of image parcels to provide said image.

1 17. The method of Claim 16 wherein said step of receiving includes the step  
2 of storing said plurality of image parcels in an image store and wherein said step  
3 of rendering provides for the selective rendering of said plurality of image parcels  
4 having the highest associated resolutions to the corresponding regions of said  
5 image.

1 18. The method of Claim 17 wherein said step of rendering limits the selective  
2 rendering of said image parcels to image parcels having associated resolutions  
3 less than a predetermined level.

1 19. The method of Claim 18 wherein said step of rendering selectively renders  
2 said plurality of image parcels as the unique textures for the corresponding  
3 regions of said image.

- 1 20. The method of Claim 19 wherein said priority order is re-evaluated in
- 2 response to a change in said viewpoint orientation.

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